

REMARKS

Claims 1 - 18 are presently pending. In the above-identified Office Action, the Examiner objected to the claims under 35 U.S.C. § 112, second paragraph. Claims 1 - 18 were rejected under 35 U.S.C. § 102(b) as being anticipated by Komine ('173). Several additional references were cited as being pertinent to Applicant's disclosure.

For the reasons set forth more fully below, Applicant respectfully submits that the subject application properly presents claims patentable over the prior art. Accordingly, reconsideration, allowance and passage to issue are respectfully requested.

The invention disclosed and claimed in the subject Application addresses the need in the art for a system or method for efficient generation of pulsed tunable laser output in the 2.5 – 3.0 micron region. In a most general sense, the invention is an arrangement comprising a mechanism for shifting energy received at a first wavelength and outputting the shifted energy at a second wavelength. The second wavelength is a secondary emission of energy induced by a primary emission generated from the first wavelength in the shifting medium. Hence, a novel feature of the invention is the inclusion of a second mechanism, in functional alignment with the first mechanism, for containing the primary emission and **enhancing the secondary emission**. This constrains the energy to be output by the arrangement at the desired wavelength.

In addition, in accordance with the invention, the first mechanism is angle tunable, such that the output wavelength can be continuously tuned by varying the angle of the incoming energy at the first wavelength relative to the first mechanism.

In the illustrative embodiment, the first mechanism is an optical parametric oscillator having a crystal such as potassium titanyl arsenate. The crystal may be X-cut, Y-cut, etc. The second mechanism then includes first and second reflective elements. The first and second reflective elements have high reflectivity at a wavelength of the primary emission. The first reflective element also has high reflectivity at the second

wavelength of the secondary emission, and the second reflective element is at least partially transmissive at the second wavelength of the secondary emission.

In one embodiment illustrated herein, the first wavelength is approximately 1.06 microns, the second wavelength is approximately 2.59 microns and the primary emission includes energy at 1.53 microns.

Thus, the present invention provides a novel system and method for generating tunable pulsed laser output at 2.59 microns by converting the output of a standard 1 micron laser using a tunable monolithic serial optical parametric oscillator.

The invention is set forth in claims of varying scope of which Claim 1 is illustrative. Claim 1 recites:

1. An arrangement comprising:
first means for shifting energy received at a first wavelength and outputting said shifted energy at a second wavelength, said second wavelength being a secondary emission of energy induced by a primary emission generated from said first wavelength by said first means and
second means disposed in functional alignment with said first means for containing said primary emission and **enhancing said secondary emission thereby.** (Emphasis added.)

None of the references, teach, disclose or suggest the invention as presently claimed. That is, none of the references, taken alone or in combination, teach, disclose or suggest an arrangement comprising first means for shifting energy to provide primary and secondary emissions and second means for containing the primary emission and **enhancing the secondary emission thereby.**

In the above-identified Office Action, the Examiner cited Komine in the rejection of the claims. Komine purports to teach a tunable mid-infrared wavelength converter using cascaded parametric oscillators. The Examiner asserts that in figures 1 and 3, Komine shows the first and second means of Claim 1. In this connection, the Examiner references col. 3, line 51 to col. 6, line 65. However, Applicant respectfully submits that this assertion is not supported by the reference.

Komine's idler wavelength (wave 2) is clearly part of the primary **process** inasmuch as it is generated by wave 0 as is wave 1. Indeed, Komine typifies the prior art inasmuch as Komine does not show an awareness of emissions associated with a

secondary process. As defined in the present Application (page 6 line 4 through page 7, line 4), the secondary process occurs, and is due to, the feedback through the crystal of an output wave such as wave 1 of the Komine disclosure. Komine clearly does not show any awareness of emissions resulting from a reflection of wave 1 back through OPO 1. Consequently, Komine does not teach, show or suggest means for **enhancing** emissions resulting from a **secondary process**.

The references cited but not applied have been considered. None of the references, taken alone or in combination, teach, disclose or suggest the invention as presently claimed.

In the Office Action, the Examiner rejected the claims under 35 U.S.C. § 112, second paragraph as being “narrative confusing, vague and indefinite.” However, Applicant disagrees with the Examiner’s characterization of the claims. For example, the Examiner suggests that it is not clear what the term “arrangement” is intended to mean in the claim. In this regard, Applicant has three points to consider. First, the term “arrangement” is commonly used in claim language. Secondly, the term is used in the preamble and therefore is not meant to be a limitation as suggested by the Examiner. Thirdly, what is meant by the term “arrangement” has been fully and adequately described in the Specification as required by 35 U.S.C. § 112. Accordingly, Applicant respectfully submits that this rejection is improper and should be withdrawn.

The Examiner suggests that the claim recites “first means” and “second means” without **the** recitation. Applicant’s response is: “What recitation?” This is a **means plus function** claim. For each of the recited means, Applicant has provided an associated functional recitation. Accordingly, Applicant respectfully submits that this rejection is improper and should be withdrawn as well.

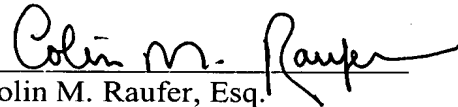
Next, the Examiner objected to the use of the limitation “functional alignment”. Again, the meaning of this commonly used phrase is clear from the Specification. Nonetheless, Applicant hereby agrees to a deletion of the term ‘functional’ by Examiner’s amendment if the Examiner prefers to do so.

Applicant’s position is the same with respect to the objections to the terms “adapted” and “mechanism” as used in the claims. The meaning of these commonly used

terms is clear from the Specification to those of ordinary skill in the art. Applicant invites the Examiner to suggest alternative language which the Examiner feels might be more clear without unduly narrowing the claims beyond that required to distinguish the invention over the prior art.

In the interim, Applicant respectfully submits that the subject application properly defines an invention patentable over the prior art. Reconsideration, allowance and passage to issue are respectfully requested.

Respectfully submitted,
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